GEOS Benchmark How To

1) Untar the YOTC.tar.gz file.

A folder will be created called "YOTC". This document will refer to this location as "/path/to/untarred/YOTC".

2) Build the Baselibs package.

Baselibs is a group of 3rd party software libraries required for GEOS to run: ESMF, NetCDF, HDF, and others. A sample build command can be found in /path/to/untarred/YOTC/GMAO-Baselibs-3_1_5/src/makecommand. The example shown below is for the Intel compiler and MPI library:

```
cd
/path/to/untarred/YOTC/GMAO-Baselibs-3_1_5/src
make install CC=mpiicc CXX=mpiicpc F77=mpiifort F90=mpiifort
ESMF_COMPILER=intel ESMF_COMM=intelmpi
```

A successful build should take approximately 30 minutes, and will install a full set of Baselibs libraries in /path/to/untarred/YOTC/GMAO-Baselibs-3_1_5/Linux. If you should need to recompile, be sure to use **gmake distclean** before doing so.

3) Build GEOS.

To change compiler/compiler flags/MPI library and other options, edit /path/to/untarred/YOTC/Fortuna-1_3/src/Config/ESMA_arch.mk or ESMA_base.mk

```
setenv BASEDIR
/path/to/untarred/YOTC/GMAO-Baselibs-3_1_5
cd /path/to/untarred/YOTC/Fortuna-1_3/src
make install
```

See the file /path/to/untarred/YOTC/Fortuna-1_3/src/BUILD for additional information.

4) Run GEOS.

Edit the /path/to/untarred/YOTC/gcm_run.j script by changing the experiment directories on lines 67-68. If you're running the Portable Batch System (PBS) queueing system, make sure you also modify the PBS batch parameters at the top of the file. Then run the script.

5) Examine timings.

In the standard output, search for the following line: "Times for DYN". The following output is timing information for the various components of the model. You can calculate the overall computational time and overall I/O time in this manner:

Computational time - report values from the following subsections in the timing output, and add them to obtain the overall computational time:

```
AGCM > SUPERDYNAMICS

PHYSICS > GWD
PHYSICS > MOIST
PHYSICS > SURFACE
PHYSICS > TURBULENCE
PHYSICS > CHEMISTRY
PHYSICS > RADIATION

OGCM > RUN
OGCM > InitChild
OGCM > OBIO
OGCM > ORAD
OGCM > SEAICE
OGCM > OCEAN
```

IO time - report values from the following subsections in the timing output, and add them to obtain the overall computational time:

```
AGCM > GenInitTot
AGCM > GenFinalTot

OGCM > GenInitTot
OGCM > GenFinalTot

HIST > Run
```